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BRIEF REPORT

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Increasing incidence of imported schistosomiasis in Mallorca, Spain

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Schistosomiasis represents an important public health burden in developing countries. Worldwide, more than 200 million people are infected and approximately 85% of them are living in Africa [1, 2]. Anecdotal observations have suggested the incidence of imported schistosomiasis on the Spanish island of Mallorca has increased in recent years. In order to investigate this possibility, a retrospective study was conducted to determine the epidemiology of infection and the characteristics of patients diagnosed with schistosomiasis in Mallorca over a recent 8-year period.

All cases of schistosomiasis diagnosed at the University Hospital Son Dureta, Palma de Mallorca between January 1995 and December 2002 were analyzed. This 878-bed hospital is the largest hospital in Mallorca and serves as the reference microbiology laboratory for the island. Schistosomiasis was diagnosed by microscopic detection of eggs in urine, stool, or semen specimens. Infected individuals were treated with praziquantel 40 mg/kg in a single or divided dose and were scheduled for a follow-up examination 2–6 months after treatment completion. For all patients with schistosomiasis, information pertaining to demographics, clinical characteristics, treatment regimen, laboratory results, and radiological findings was collected and stored in the patient records. This data was retrieved and analyzed in the present study.

During the period evaluated, a total of 16 patients were diagnosed with imported schistosomiasis due to the following species: *S. haematobium* (*n*=11), *S. mansoni* (*n*=2), mixed infection with *S. haematobium* and *S. mansoni* (*n*=2), and an undetermined species thought to be either *S. haematobium* or *S. intercalatum* (*n*=1). Schistosoma eggs were also detected in specimens in which they are not typically present, i.e., *S. haematobium* in the stool of two patients and the semen of one patient and *S. mansoni* in the urine of two patients with mixed infection. Nine patients were found to be concomitantly infected with one or more of the following parasites: *Blastocystis hominis*, *Giardia lamblia*, *Dientamoeba fragilis*, *Ascaris lumbricoides*, *Trichuris trichiura*, *Sarcoptes scabiei*, *Plasmodium falciparum*, and *Plasmodium malariae*.

Mallorca is the largest of the Spanish Balearic Islands with a registered population of 730,778 inhabitants in 2002. In recent years, the number of immigrants has increased, with many arriving from non-European countries [3]. In 1996 a total of 23,410 immigrants was registered in Mallorca and 25% of them were of non-European origin. By 2002, the number of immigrants had increased to 76,916 and 45% were from non-European countries. The majority of the non-European immigrants arrived from South America (*n*=18,239) and Africa (*n*=11,571), with many also arriving from Asia (*n*=2,323) and Central America (*n*=1,945). In most of these geographic areas schistosomiasis is endemic.

As shown in Fig. 1, the incidence of schistosomiasis in Mallorca rose considerably during the period studied, as did the number of immigrants of non-European origin. The median age of infected individuals identified in our evaluation was 24 years (range, 6–48 years), and 94% were male. All of the schistosomiasis infections were acquired in Africa. Only one patient was a traveler, and this Spanish national had contracted schistosomiasis while visiting Mali. The remaining 15 patients were all African

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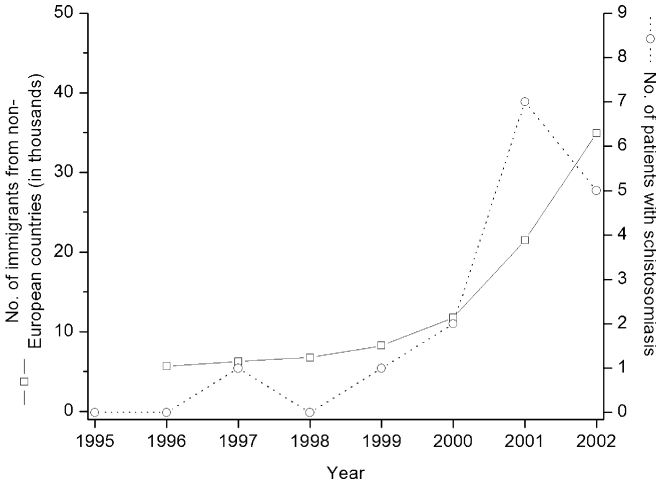

Fig. 1 Annual incidence of imported schistosomiasis in Mallorca correlated with the number of immigrants from non-European countries between 1995 and 2002

immigrants, with the majority (n=5) originating from Mali and the others coming from Guinea, Equatorial Guinea, Nigeria, Senegal, and Cameroon. Six of the infected immigrants had resided in Mallorca for 1 year or more.

Hematuria was present in all of the 13 patients with *S. haematobium* infection. Other signs or symptoms included abdominal pain (5 patients), fever (4 patients), pruritus (2 patients), headache (1 patient) and chills (1 patient). Eosinophilia (>5% of the total leukocyte count) was present in 11 of 12 patients and ranged from 5.1% to 36.6%. Radiologic examination of the urinary bladder was performed for nine patients and abnormalities were found in four of them, i.e., thickening of the bladder wall, bladder wall lesion, urethral stenosis, and urinary bladder tumor. Only six patients presented for the scheduled follow-up visit, and none of these patients reported treatment failure or drug-related side effects.

The results of our evaluation show that the incidence of imported schistosomiasis in Mallorca rose considerably between 1995 and 2002, as did the number of immigrants of non-European origin. All of the *Schistosoma* infections were acquired in Africa, and 94% of the infections occurred in young male immigrants. Hematuria and eosinophilia were present in a high proportion of patients. The clinical presentation of all immigrants was consistent with chronic schistosomiasis as reported by other investigators [4, 5]. The finding of *Schistosoma* eggs in specimens where they are not usually present (i.e., *S. haematobium* in stool and *S. mansoni* in urine) has been reported previously; therefore, both urine and stool specimens should be examined for schistosomiasis [6, 7]. Infection due to *S. intercalatum* may have been missed during the period we evaluated since procedures for differentiating this organism from *S. haematobium* were not performed [8]. Importantly, 56% of the patients we identified were infected with one or more additional parasite(s), which is consistent with previously reported findings [4, 9]. The low rate of follow-up (38%) we found could be explained by the illegal status of some immigrants, change of residency and/or communication difficulties [10].

The data presented here indicate the incidence of imported schistosomiasis in Mallorca may continue to increase in conjunction with immigration from African countries. Laboratory testing for eosinophilia and hematuria may thus be warranted for immigrants arriving from areas in which schistosomiasis is endemic. A similar proposal to screen refugees and immigrants to the USA for infectious diseases has been made recently [11]. Healthcare workers in Mallorca and elsewhere should be aware of schistosomiasis, which is an emerging disease.

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